

Study Objective

To conduct a sampling survey to detect and quantify the presence of microplastics on New Hampshire beaches using citizen scientists.

What are Microplastics?



Microplastics: Ubiquitous and most abundant type of plastic debris in the global marine environment today.

Caused by the fragmentation into smaller and smaller or by the intentional manufacturing "micro" sized plastics.

Defined as **plastics $\leq 5\text{mm}$ in size**

Microplastics: A Global Environmental & Ecological Problem

- Persist in marine environment (including beaches and water column) indefinitely
- Ingested by a wide range of organisms from zooplankton to fish to large marine mammals- causing starvation, physiological process disruptions and possible toxicity issues.
- Their size-makes plastic debris readily accumulate harmful chemicals such as DDT,PCBs, PBDEs from surrounding seawater
- Microplastics can also LEACH contaminants upon ingestion
- Microplastics (plastic debris in general) can also release monomers and other toxic chemicals such as plasticizers, flame retardants and microbial agents that are incorporated into plastics during manufacturing



What was done?

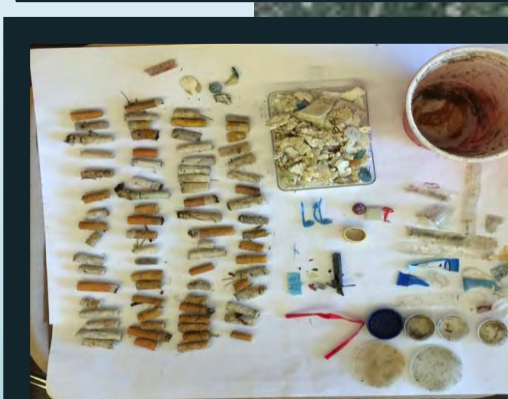
1 Year
3 Sampling "Blitzes"
8 Beaches Surveyed
324 gallons of sand collected and processed
35 Volunteers
1,305 microplastic pieces $\geq 1\text{mm}$
7,448,809 potential microplastics in first 2cm in all beaches combined



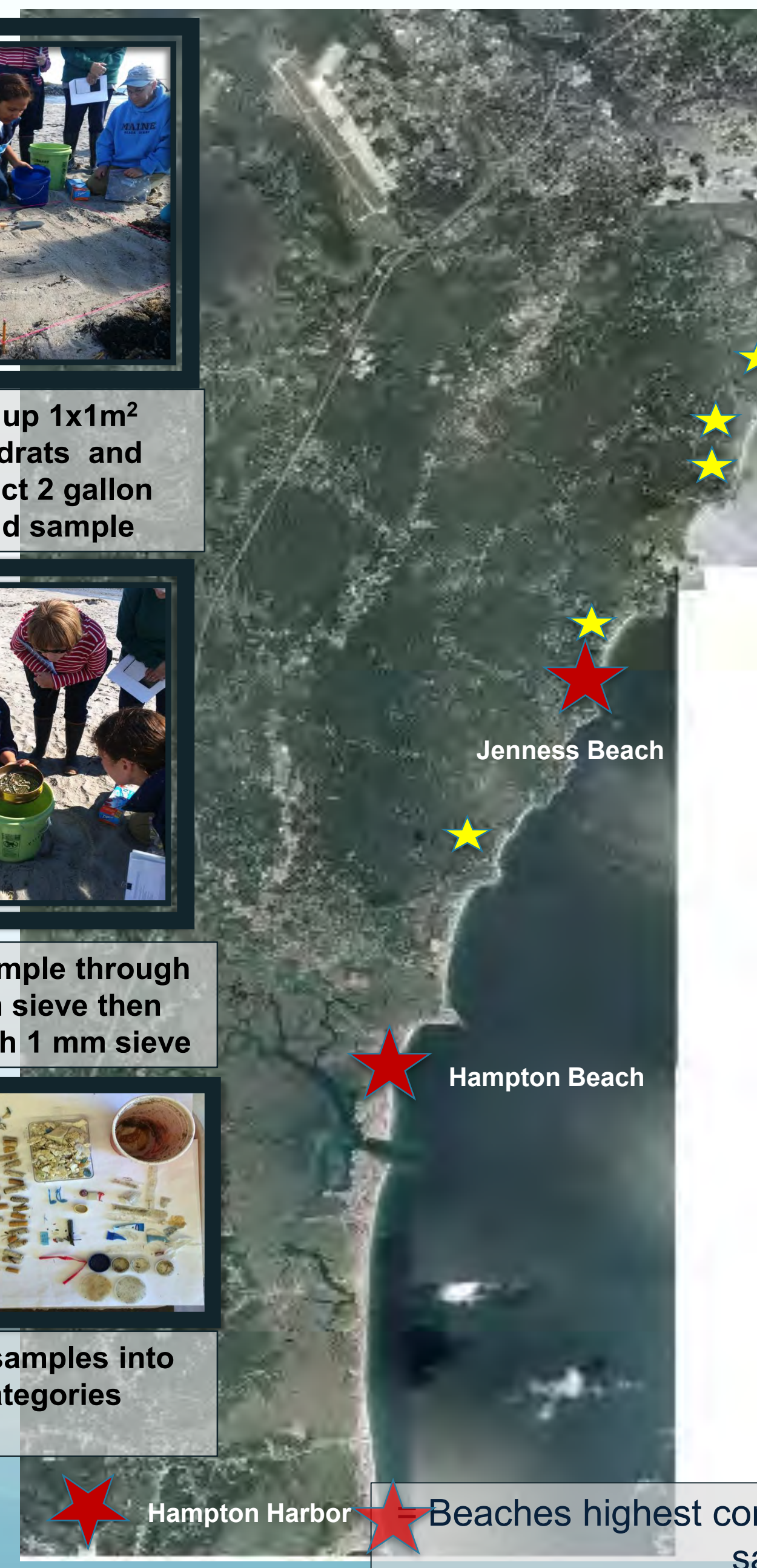
Set up 1x1m² quadrats and collect 2 gallon sand sample



Sift sample through 5mm sieve then through 1 mm sieve



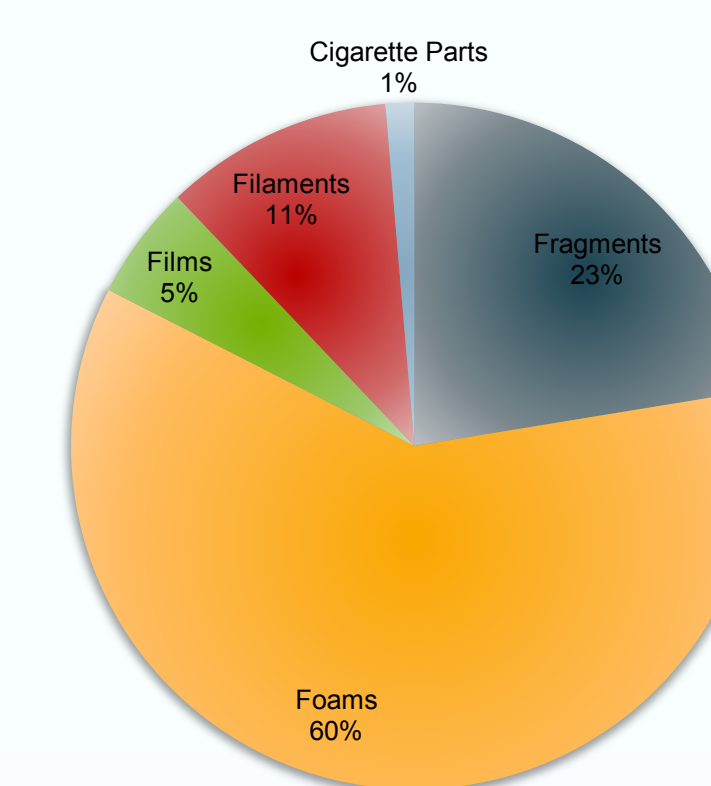
Sort samples into categories



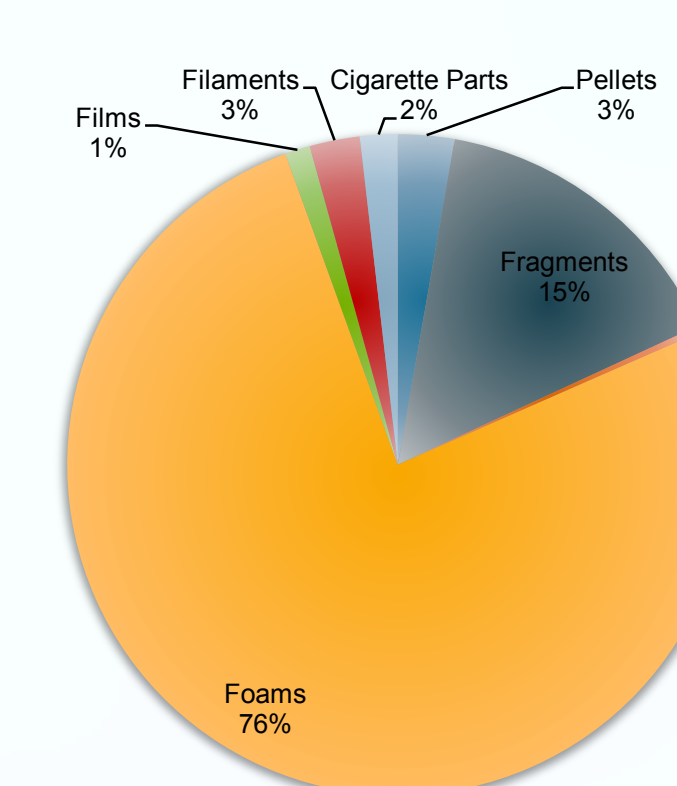
Beaches highest concentration of microplastics during 3 sampling "blitzes"

Findings

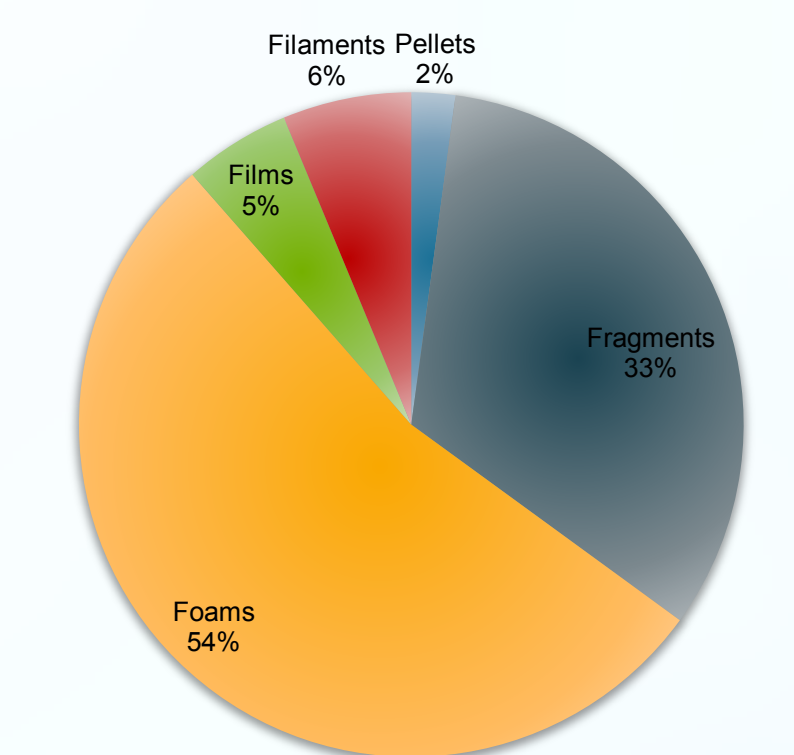
October 2013 All $>1\text{mm}$



April 2014 All $>1\text{mm}$



September/October 2014 All $>1\text{mm}$



* Beach	Foams	Plastic Fragments	Other
Hampton Beach	85%	11%	4%
Hampton Harbor	22%	69%	9%
Jenness Beach	68%	22%	10%
Jenness Beach Cable Rd	75%	23%	2%
New Castle Beach	16%	67%	17%
North Hampton	38%	52%	10%
Wallis Sands State Beach	40%	48%	11%
Wallis Sands Wallis Rd	58%	25%	17%

* All data from each beach combined

Regardless of time of year or beach, foams and plastic fragments were the predominant microplastic types found in NH.

** Beach	Total (Extrapolated) plastics concentrations in first 2 cm
New Castle Beach	14,139
Hampton Harbor	19,674
Wallis Sands State Beach	32,875
Wallis Sands Wallis Rd	58,837
North Hampton	113,978
Jenness Beach	470,694
Jenness Beach Cable Rd	911,137
Hampton Beach	5,827,475

* All data from each beach combined

There was a lot of variability in the data likely due to several factors including Who sampled, what time of year, weather, beach topography, whether the beach is groomed, high learning curve for what to look for in the first sampling blitzes.

However, we are starting to get a better picture of the prevalence and potential concentrations and on which beaches...